UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

August 10, 2021

Erhard W. Koehler
Senior Technical Advisor, N.S. Savannah
U.S. Department of Transportation
Maritime Administration (MAR-640.2)
1200 New Jersey Avenue, SE W25-209/212
Washington, DC 20590-0001

SUBJECT: U.S. DEPARTMENT OF TRANSPORTATION, N.S. SAVANNAH - NRC INSPECTION REPORT NO. 05000238/2021001

Dear Mr. Koehler:

On July 12, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection under Inspection Manual Chapter (IMC) 2545, “Research and Test Reactor Inspection Program” at the Nuclear Ship (N.S.) Savannah berthed in Baltimore, Maryland. A combination of on-site and remote inspection activities (in-office reviews) were performed as a consequence of the COVID-19 public health emergency (PHE) during this inspection period. The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and the conditions of your license. The inspection consisted of observations by the inspector, interviews with ship personnel, a review of procedures and records and ship walk-downs. The results of the inspection were discussed with you at the conclusion of the inspection on July 12, 2021, and are described in the enclosed report. Based on the results of this inspection, no findings of safety significance were identified.

In accordance with 10 CFR Part 2.390 of the NRC’s "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of the NRC’s document system (ADAMS). ADAMS is accessible from the NRC Web Site at https://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Current NRC regulations and guidance are included on the NRC's website at www.nrc.gov; select **Radioactive Waste; Decommissioning of Nuclear Facilities**; then **Regulations, Guidance and Communications**. The current Enforcement Policy is included on the NRC's website at www.nrc.gov; select **About NRC**, **Organizations & Functions; Office of Enforcement; Enforcement documents**; then **Enforcement Policy** (Under 'Related Information'). You may also obtain these documents by contacting the Government Printing Office (GPO) toll-free at 1-866-512-1800. The GPO is open from 8:00 a.m. to 5:30 p.m. EST, Monday through Friday (except Federal holidays).

No response to this letter is required. If you have any questions, please contact Katherine Warner of my staff at Katherine.Warner@nrc.gov or (610) 337-5389.

Sincerely,

Anthony M. Dimitriadis

Digitally signed by Anthony M. Dimitriadis
Date: 2021.08.10 07:31:54 -04'00'

Anthony Dimitriadis, Chief
Decommissioning, ISFSI, and Reactor Health Physics Branch
Division of Radiological Safety and Security

Docket No. 05000238
License No. NS-1

Enclosure:
Inspection Report No. 05000238/2021001

cc w/Enclosure: Art Paynter, QA Manager
John Osborne, Licensing and Compliance Manager
State of Maryland

U.S. DEPARTMENT OF TRANSPORTATION, N.S. SAVANNAH - NRC INSPECTION REPORT NO. 05000238/2021001 DATED AUGUST 10, 2021

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SUNSI Review Complete: KWarner

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DATE	08/09/2021		08/09/2021					

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U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Docket No.	05000238
License No.	NS-1
Inspection No.	05000238/2021001
Licensee:	U.S. Department of Transportation Maritime Administration (MARAD) Washington, DC 20590
Facility:	N.S. Savannah
Location:	Canton Marine Terminal Pier 13 4601 Newgate Avenue Baltimore, MD 21224
Inspection Dates:	January 1 – July 12, 2021
Inspector:	Katherine Warner, Senior Health Physicist Decommissioning ISFSI, and Reactor Health Physics Branch Division of Radiological Safety and Security
Approved By:	Anthony Dimitriadis, Chief Decommissioning ISFSI, and Reactor Health Physics Branch Division of Radiological Safety and Security

Enclosure

EXECUTIVE SUMMARY

U.S. Department of Transportation
N.S. Savannah
NRC Inspection Report No. 05000238/2021001

A routine announced safety inspection was conducted January 1, 2021 – July 12, 2021 with on-site inspections conducted on March 9, 2021 and July 12, 2021, at the Nuclear Ship (N.S.) Savannah, currently berthed at a marine terminal in Baltimore, Maryland. Additional inspection activities (in-office reviews) were conducted remotely as a consequence of the COVID-19 public health emergency (PHE) during this inspection period. NRC oversight of the decommissioning project is managed by staff from the NRC's Reactor Decommissioning Branch, Division of Decommissioning, Uranium Recovery, & Waste Programs (DUWP), Office of Nuclear Material Safety and Safeguards (NMSS) with inspection support from the NRC Region I office.

The N.S. Savannah is classified by the NRC as a research and test reactor for inspection purposes. The program for overseeing the decommissioning of research and test reactors is described in Inspection Manual Chapter (IMC) 2545, "Research and Test Reactor Inspection Program." The inspection included a review of the programs and activities associated with the N.S. Savannah while the vessel is undergoing decommissioning activities. The inspection consisted of ship walk-downs, observations by the inspector, interviews with N.S. Savannah personnel, and a review of procedures and records.

Based on the results of this inspection, no findings of safety significance were identified.

REPORT DETAILS

1.0 Background

The N.S. Savannah is the property of the U. S. Department of Transportation (DOT), Maritime Administration (MARAD). The N.S. Savannah was designed, constructed, and operated as a joint research and development project of MARAD and the Atomic Energy Commission. The ship operated from 1961 until it was removed from service in 1970. In 1971, the ship was defueled and various dismantling activities were conducted through 1976 to remove much of the radioactive material from the ship and to isolate radiologically contaminated systems. These activities included removing ion exchange systems and resins and most of the water from the primary, secondary, and auxiliary systems. A "Possession Only" license was issued in May 1976. The N.S. Savannah is a registered National Historic Landmark. In May 2008, the ship was towed from Norfolk, Virginia to Baltimore, Maryland.

2.0 Research and Test Reactor Decommissioning

a. Inspection Scope (Inspection Procedure 69013)

In an October 31, 2017 letter, MARAD representatives submitted a license amendment request to modify the license to remove a license condition that prohibited dismantling and disposal of the facility without prior approval of the Commission. This position was a remainder from a period when the license was under an earlier regulatory framework and did not reflect the current language of Title 10 of the Code of Federal Regulations, Chapter 50.82. On April 23, 2018, NRC staff approved this action via a letter and associated safety evaluation (ML18081A134). During this inspection period, the licensee completed its Phase 1 decommissioning activities, including a substantial portion of the planning for decommissioning and performed certain dismantlement activities.

The inspection consisted of observations and tours by the inspector, interviews with N.S. Savannah personnel, and a review of procedures and records to evaluate the organization, staffing and work controls. The inspector reviewed the status of activities associated with the site decommissioning to determine if activities were in accordance with licensed requirements. The inspector conducted document reviews and held interviews with ship personnel to determine if procedures and processes conform with the regulations and guidance associated with 10 CFR 50.59 and to determine if changes made under 10 CFR 50.59 required prior NRC approval. The inspector reviewed documents and interviewed site personnel to evaluate if audits and self-assessments were performed, and to determine if issues were identified and corrected in accordance with the site's corrective action program (CAP).

b. Observations and Findings

N.S. Savannah was allocated funds for decommissioning starting fiscal year 2017. The licensee developed a three-phase plan for decommissioning. The three-phase plan includes two years for decommissioning planning and engineering, four years for decontamination and dismantlement activities, and one year for license termination. It should be noted that these phases will overlap as work progresses. The licensee has completed Phase 1 activities, including eliminating all current radiologically controlled

areas (RCAs) outside the reactor compartment and cold chemistry laboratory. These RCAs include the hot chemistry laboratory, the port and starboard buffer seal charging pump rooms, the port and starboard stabilizer rooms, the A deck health physics laboratory and the B-1 stateroom.

During this inspection period, MARAD awarded an integrated services contract to Nuclear Ship Support Services (NSSSJV), LLC to perform contract activities that support MARAD's decommissioning phases II and III, which include dismantlement and license termination activities. NSSSJV is a joint venture between Radiation Safety and Control Services (RSCS) and Energy*Solutions* Federal Support (ESFS). RSCS will provide the radiation protection and emergency response services. Keystone Shipping Company is subcontracted to provide custodial care of the vessel. Routine maintenance, surveillance tests, and environmental and radiological monitoring in support of technical specification requirements continue under the contract. The contract Notice to Proceed was issued on April 1, 2021 and the contract has a period of performance of five years.

The inspector determined that 10 CFR 50.59 screenings and evaluations were being performed and that the licensee had trained and qualified individuals to perform the evaluations. The inspector determined that changes under 10 CFR 50.59 did not require prior NRC approval, and safety reviews were performed for design changes and modifications in accordance with applicable regulatory requirements, and license conditions.

The inspector did not identify any material condition or postings issues of the areas of the ship accessed that contain radioactive material. All radioactive material is currently being stored on the ship so there has been no release of radioactive material as effluents or as radioactive material. The inspector confirmed that the waste generated from recent dismantlement activities was being stored on the ship and the area was posted appropriately.

The inspector verified audits were being performed by qualified individuals independent of the organization being audited. The inspector determined that issues were being identified and entered into the corrective action program (CAP) in a timely manner and the issues were effectively screened, prioritized and evaluated commensurate with their safety significance.

The inspector specifically focused on the radiation protection program during this inspection due to deficiencies identified in IR 2020001 (ADAMS Accession Number ML20337A027). The inspector verified that appropriate corrective actions were taken with the performance of the annual audit, which included performance of quarterly segments rather than on an annual basis so any potential deficiencies are expected to be identified and resolved in a more timely manner. The inspector reviewed corrective actions associated with CAR 2020-036, contamination found in a clean area (D deck Rad Sampling Room). This area was one of the RCAs previously down posted and was subsequently re-posted and controlled after contamination was identified. The inspector noted that access to this room had been restricted even after release of the area. The site performed extent of condition surveys resulting in CAR 2021-002, which identified several areas with elevated activity in the port stabilizer room. Based on these findings, the site planned and performed surveys of the five areas, including the two areas determined to have low levels of contamination, including the forward control area and port stabilizer room as well as three additional areas: the starboard stabilizer room, and

the port and starboard charging pump rooms. When contaminated areas were identified per the site plan, they were decontaminated mostly using nondestructive techniques with limited grinding and cutting of contaminated piping. The inspector observed a sample of surveys and decontamination work and performed walk-downs of several areas. The licensee determined the cause of the previous deficiency to be inadequate surveys. During this inspection period, the site had appropriately decontaminated, resurveyed, and down posted these RCAs. The inspector noted a more proactive approach in the radiation protection program during this inspection period.

c. Conclusions

There were no findings of significance identified during this inspection.

3.0 Exit Meeting Summary

On July 12, 2021, the inspector presented the inspection results to Erhard Koehler, Senior Technical Advisor, N.S. Savannah. No proprietary information was retained by the inspector or documented in this report.

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee and contractors

E. Koehler, Senior Technical Advisor, MARAD
J. Osborne, Licensing and Compliance Manager, Savannah Technical Staff
A. Paynter, Quality Assurance Manager, Savannah Technical Staff
D. Roberson, Radiation Safety Officer, RSCS
J. Tarzia, Executive Director, RSCS

PARTIAL LIST OF DOCUMENTS REVIEWED

21-001, Non-Routine Decontamination Plan Decontaminate and Release the Forward Control Radiation Sampling Room from a Contaminated Area
21-001, Non-Routine Survey Plan Release the Forward Control Area from Radiological Controls
21-002, Release the Starboard and Port Stabilizer Rooms from Radiological Controls
21-003, Verification of the Starboard and Port Charging Pump Rooms Release from Radiological Controls
Annual Report for CY 2020, Revision 0
CR-135, Evaluation of the NS Savannah Instrumentation Program, June 23, 2021
Instrument Calibration Certificates (a selection), 2019 - 2020
QSA-2020-003, 2019 Annual Radiation Protection Program Assessment, Revision 0
QSA-2020-004, 2020 Annual Radiation Protection Program Assessment, Revision 0
QSA-2021-002, 2021 Annual Radiation Protection Program Assessment, Revision 0
RWP# 21-S-021, Forward Control Area, February 2, 2021
STS-005-001, Radiation Protection Plan, Revision 3
STS-005-008, Radiological Instrumentation and Survey Documentation, Revision 4
STS-005-009, Establishing and Posting Radiological Areas, Revision 4
STS-109, Historic Site Assessment Excerpts addressing 50.75(g) records
STS-216, Annual Radiological Environmental Monitoring and Radioactive Effluent Release Reports for CY2020, March 31, 2021

Corrective Action Reports and Resolutions

2020-025
2020-036
2020-064
2020-065
2020-066
2020-068
2021-002
2021-003
2021-006
2021-007
2021-027
2021-032

Work Orders

2021-032-001

ITEMS OPEN, CLOSED, AND DISCUSSED

None

LIST OF ACRONYMS USED

CAP	Corrective Action Program
CAR	Corrective Action Report
CFR	Code of Federal Regulations
DOT	U. S. Department of Transportation
DUWP	Division of Decommissioning, Uranium Recovery, & Waste Programs
ESFS	Energy*Solutions* Federal Support
IMC	Inspection Manual Chapter
MARAD	U. S. Maritime Administration
NMSS	Office of Nuclear Material Safety and Security
NRC	Nuclear Regulatory Commission
N.S.	Nuclear Ship
NSSSJV	Nuclear Ship Support Services
RCA	Radiologically Controlled Area
RSCS	Radiation Safety and Control Services